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THAT WHICH IS CLAIMED:

1 1. An isolated DNA molecule comprising a nucleotide sequence selected
2 from the group consisting of:

- 3
- 4 a) a sequence encoding a poly ADP-ribose polymerase having the amino acid
5 sequence set forth in SEQ ID NO. 2,
6 b) the nucleotide sequence set forth in SEQ ID NO. 1,
7 c) a nucleotide sequence that corresponds to an antisense sequence for the
8 nucleotide sequence set forth in SEQ ID NO. 1,
9 d) a nucleotide sequence encoding the C-terminal domain of a poly ADP-
10 ribose polymerase having the amino acid sequence set forth in SEQ ID
11 NO. 2,
12 e) a nucleotide sequence encoding the C-terminal domain of a poly ADP-
13 ribose polymerase having the amino acid sequence set forth in SEQ ID
14 NO. 4,
15 f) the nucleotide sequence set forth in SEQ ID NO. 3,
16 g) a nucleotide sequence that hybridizes to any one of the nucleotide
17 sequence of a) - f) under stringent conditions.

1 2. A chimeric gene comprising a promoter capable of driving expression of a
2 gene in a plant cell operably linked to a nucleotide sequence of claim 1.

1 3. The chimeric gene of claim 2, wherein the nucleotide sequence encodes a
2 poly ADP-ribose polymerase having the amino acid sequence set forth in SEQ ID NO.

3 2.

1 4. The chimeric gene of claim 3, wherein said coding sequence is the
2 nucleotide sequence set forth in SEQ ID NO. 1.

1 5. A vector comprising the chimeric gene of claim 4.

1 6. A plant cell transformed with the chimeric gene of claim 5.

1 7. A plant comprising the chimeric gene of claim 4.

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CONT.

- 1 8. The chimeric gene of claim 2, wherein the nucleotide sequence is an antisense sequence for a plant poly ADP-ribose polymerase. WD
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- 1 9. A vector comprising the chimeric gene of claim 8.
- 1 10. A plant cell transformed with the vector of claim 9.
- 1 11. A plant comprising the chimeric gene of claim 8.
- 1 12. A transformed plant having incorporated into its genome a DNA molecule,
- 2 said molecule comprising a promoter capable of driving expression of a gene in a
- 3 plant cell operably linked to a nucleotide sequence selected from the group consisting
- 4 of:
- 5
- 6 a) a sequence encoding a poly ADP-ribose polymerase having the amino acid
- 7 sequence set forth in SEQ ID NO. 2,
- 8 b) the nucleotide sequence set forth in SEQ ID NO. 1,
- 9 c) a nucleotide sequence that corresponds to an antisense sequence for the
- 10 nucleotide sequence set forth in SEQ ID NO. 1,
- 11 d) a nucleotide sequence encoding the C-terminal domain of a poly ADP-
- 12 ribose polymerase having the amino acid sequence set forth in SEQ ID
- 13 NO. 2,
- 14 e) a nucleotide sequence encoding the C-terminal domain of a poly ADP-
- 15 ribose polymerase having the amino acid sequence set forth in SEQ ID
- 16 NO. 4,
- 17 f) the nucleotide sequence set forth in SEQ ID NO. 3,
- 18 g) a nucleotide sequence that hybridizes to the nucleotide sequence of a) - f)
- 19 under stringent conditions.
- 1 13. The transformed plant of claim 12, wherein the nucleotide sequence
- 2 encodes a poly ADP-ribose polymerase having the amino acid sequence set forth in
- 3 SEQ ID NO. 2.
- 1 14. The transformed plant of claim 13, wherein said coding sequence is the
- 2 nucleotide sequence set forth in SEQ ID NO. 1.

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15. The transformed plant of claim 12, wherein the nucleotide sequence is an antisense sequence for a plant poly ADP-ribose polymerase.

16. The transformed plant of claim 12, wherein said coding sequence encodes a plant poly ADP-ribose polymerase having the amino acid sequence set forth in SEQ ID NO. 2.

17. The transformed plant of claim 12, wherein said plant is a dicot.

18. The transformed plant of claim 13, wherein said plant is a monocot.

19. The transformed plant of claim 18, wherein said plant is maize.

20. Seed of the plant of any one of claims 17-19.

✓ 21. A method for modulating the metabolic state of a plant cell, said method comprising transforming said plant with a DNA construct, said construct comprising a promoter that drives expression in a plant cell operably linked with a nucleotide sequence selected from the group consisting of:

- a) a sequence encoding a poly ADP-ribose polymerase having the amino acid sequence set forth in SEQ ID NO. 2,
- b) the nucleotide sequence set forth in SEQ ID NO. 1,
- c) a nucleotide sequence that corresponds to an antisense sequence for the nucleotide sequence set forth in SEQ ID NO. 1,
- d) a nucleotide sequence encoding the C-terminal domain of a poly ADP-ribose polymerase having the amino acid sequence set forth in SEQ ID NO. 2,
- e) a nucleotide sequence encoding the C-terminal domain of a poly ADP-ribose polymerase having the amino acid sequence set forth in SEQ ID NO. 4,
- f) the nucleotide sequence set forth in SEQ ID NO. 3,
- g) a nucleotide sequence that hybridizes to the nucleotide sequence of a) - f) under stringent conditions.

22. The method of claim 21, wherein the nucleotide sequence encodes a poly ADP-ribose polymerase having the amino acid sequence set forth in SEQ ID NO. 2.

- 1 23. The method of claim 22, wherein said coding sequence is the nucleotide
- 2 sequence set forth in SEQ ID NO. 1.

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